INTERNATIONAL BULLETIN
OF
BACTERIOLOGICAL NOMENCLATURE
AND
TAXONOMY

Volume 4 April 15, 1954 Number 2

* * * * * * * * *

PRELIMINARY REPORT OF THE COMMITTEE ON THE FAMILY NEISSERIACEAE[1,2]

Members of the Committee

Chairman: Prof. E.G.D. Murray, Montreal, Canada

Members: Lt. Col. H.J. Bensted, London, England
Miss Sophia M. Cohen, Albany, New York
Dr. M.H. Gordon, East Molesay, Surrey, Eng.
Dr. Ralph St. John-Brooks, Dublin, Ireland
Dr. C. Phillip Miller, Chicago, Illinois
Dr. A.R. Prévot, Paris, France
Dr. Michael J. Pelczar, College Park, Maryland
Dr. Th. Thjøtta, Oslo, Norway

Secretary: Dr. Sara E. Branham, Bethesda, Maryland

The work of this Committee will be discussed under the following heads:

1) A summary of the active research that has been done.
2) Recommendations made by the Committee.
3) Plans for future work.

1. Active Research:

When this special committee was formed in April, 1948, the members agreed that, although its primary object was to clarify the classification of the meningococci, its activities should include all members of the family Neisseriaceae, which embraces the two genera Neisseria and Veillonella.

[1]Presented at the Vth International Congress for Microbiology, Rio de Janeiro, Brazil, 1950.

[2]This preliminary report of the Subcommittee on the family Neisseriaceae is published at the request of the Subcommittee in order to complete its published records.

Most of the active research reported herein has been done in the laboratories of the University of Maryland under the direction of Dr. Michael Pelczar. A list of seven papers, published or in press, reporting these studies in detail is appended hereto. A summary of the chief findings follows:

a) A number of strains of Gram-negative diplococci were isolated from the pharyngeal cavity of guinea-pigs. These had typical neisserian morphology and constituted a fairly homogeneous group culturally and biochemically, but did not correspond to any of the described species of Neisseria. The name N. caviae has been suggested for this new member of the genus.

b) It has been shown that changes in the composition of the basal medium employed for carbohydrate utilization tests may alter the fermentative capacity of some strains of Neisseria. This is of special interest in the case of those members of this genus in which fermentation is relied upon for identification, as for example, with some of the pigmented forms.

c) No strains were encountered that fermented mannitol. Other workers have reported mannitol-fermenting strains. Dr. Pelczar will be glad to receive mannitol-fermenting cultures of Neisseria from those who encounter them.

d) A serological study has indicated considerable homogeneity among the pigmented strains that ferment the four sugars glucose, fructose, sucrose, and maltose; i.e. N. perflava. Too little experimental work has been done to draw conclusions about those fermenting fewer than four sugars (N. flava and N. subflava).

e) A special study of Gram-negative anaerobic cocci was made, comparing those designated as Neisseria with those known to be Veillonella. All of these organisms were typically small diplococci, and did not usually occur as masses of cocci. These diplococci did not have a typical neisserian appearance, and they were strict anaerobes. No criterion of difference could be found to distinguish between Veillonella and anaerobic Neisseria.

On the basis of these studies of Dr. Pelczar and his associates several recommendations can be made and some plans for future work formulated.

2. Recommendations

Several members of the Committee have acted as "referee" for certain of the Neisseriae with which they have had

unusual experience. They have evaluated work that has been done in these special fields, have consulted with other workers who are well informed about the micro-organisms in question, and have made recommendations concerning classification and nomenclature.

Neisseria gonorrhoeae Trevisan: Dr. Miller has been referee for this species and has consulted a number of people who have done much work with it. He states that he finds no justification for dividing this organism into groups or types.

Neisseria meningitidis (Albrecht and Ghon) Holland: The terminology of this species has been in special need of clarification. Confusion of groups and types, letters and Roman numerals has been great. In February, 1949, Dr. St. John-Brooks and Dr. Branham outlined a classification following Rule 7, Recommendation 8a, of the International Code of Nomenclature (See p. 293, Jour. Bact., Vol. 55, No. 3, 1948). This outline was for the purpose of stimulating discussion of the subject. Some of the members of the Committee approved this outline without stated reservations. Others offered suggestions and criticisms which were both constructive and timely. For the sake of reference this suggested outline is presented here.

Suggestions for designation of groups of meningococci, following the recommendations of the International Code of Nomenclature.

Group A (Group I, Griffith and Scott) (Types I and III, or 1 and 3, Gordon and Murray)[1] (Type A of Nicolle, Debains, and Jouan) Group I of Branham, of Rake, and of others in U.S.A.).

Group B (Group II, Griffith and Scott) (Type II of Gordon and Murray) (Type B of Nicolle, Debains and Jouan) (Parameningococcus of Dopter).

Group C (Group II alpha of Branham and of Cohen).

Group D (Included in Group II of Griffith and Scott) (Type IV of Gordon and Murray).

Group A: Members of the Committee are agreed as to the homogeneity of Group A and the desirability of designating it thus. Should it seem desirable to establish types within this

[1](In his monograph 'The Meningococcus' (1920) Dr. Murray suggested that the four 'Gordon-Murray Types' be designated as AI, AIII, BII, and BIV).

group these can be designated by numerals. Dr. Murray has pointed out that the Groups B, C, and D are different from those of Nicolle, Debains, and Jouan (the A's agree), and the A, B, and C of Pullon, and that these differences should be made very clear. This is a very important point. How can such clarification be done best? It has been suggested that the use of lower case letters for the groups will avoid confusion if the rules of nomenclature allow it. Some members of the Committee object to this proposal.

Group B: Up to a certain point all members are agreed with the definition of Group B. There is no dissent about all meningococci that seem to be of our old Group II and Type II belonging there. The only question raised here is concerning the relationship of the old Gordon-Murray Type IV to this Group B. This point will be discussed more fully in connection with Group D.

Group C: Miss Cohen has been referee for this group, and has reviewed the situation of the II alpha meningococci expertly. She feels that their distinct serological and immunological characteristics definitely warrant their designation as a group.

Group D: Strains of the proposed group are very rarely encountered and the only ones available for study are old. Hence it is not surprising that some members of the Committee have not expressed definite views as to the relationship of this group. Dr. Murray feels that this rare and local type is definitely distinct from Group II, and that it does not, therefore, belong in Group B, but should constitute Group D. Dr. Branham encountered an epidemic due to this meningococcus in 1928. These cultures, freshly isolated were highly specific and distinct from all other groups. Therefore, she is inclined to give a place to Type IV or Group IV as Group D, although she thinks that fresh strains from elsewhere should be studied before its designation should be considered settled. Miss Cohen is inclined to: 1) include these strains as Type IV within the Group B for the present; of 2) to consider them atypical until their position can be more precisely determined. Other Committee members have not yet expressed their views on this point.

Neisseria catarrhalis (Frosch and Kolle) Holland: This species has not been the subject of any special study since it has offered fewer complications than some of the other species to students of the genus.

N. sicca (von Lingelsheim) Bergey et al. This species is in need of a thorough study. Stock cultures of it from different sources vary widely. Dr. Pelczar is beginning to collect strains with such a study in view.

N. perflava Bergey et al., N. flava Bergey et al., N. subflava Bergey et al: These three pigmented species have long been the subject of much discussion. It was suggested by Dr. G.S. Wilson that they might not represent three distinct species, but that, since fermentation was the chief basis for differentiation they might be varieties of one species. Other workers have found strains of these organisms to be remarkably stable over a number of years. Dr. Pelczar's finding that strains with the fermentation reactions of N. perflava have considerable serological homogeneity offers evidence in favor of this organism being considered a definite species. On the other hand, his finding that fermentation reactions vary with the composition of the basic medium suggests caution in making definite conclusions. Strains corresponding to N. subflava seem to be very rare.

N. flavescens Branham: This organism appeared suddenly in an epidemic in Chicago, 1928, and has never been reported with certainty since. In 1928 both Branham and Cameron, independently, reported sgudies of a number of strains obtained in this outbreak. These strains were culturally and serologically homogeneous, and have remained constant in these properties to this day. It has seemed to be a clear cut species. The possibility of its being a true mutant from other pigmented strains must be considered. No other species of the Neisseria, other than the meningococcus, has been known to cause an epidemic.

N. Hemolysans Thjøtta: This species was described by Dr. Thjøtta in 1938. It has not been widely studied. The fact that it is hemolytic may possibly cause it to be overlooked on blood agar plates. Cultures of N. hemolysans are available in type culture collections.

N. discoides Prévot, N. reniformis (Cottet) Prévot, N. orbiculata Prévot: These are the anaerobic species listed in the genus Neisseria. Unfortunately type cultures have not been available to us for study and comparison.

A great many Gram-negative anaerobic diplococci have been studied by Mr. Langford, working with Dr. Pelczar. These have been compared with known strains of Veillonella sent to Dr. Pelczar by Dr. Murray. There seems to be no

distinguishing characteristic between the Gram-negative anaerobic cocci and Veillonella. It is therefore recommended that unless some evidence to the contrary can be found, these three anaerobic species be dropped from the genus Neisseria, and reconsidered in connection with the genus Veillonella discussed below. Anyone encountering anaerobic cultures which he considers Neisseria is urged to send them to Dr. Pelczar.

Veillonella: This anaerobic genus has two species listed at present, though varieties of these species are described. The many anaerobic cocci recovered by Mr. Langford in his studies are indistinguishable from the Veillonella. As mentioned above, it seems that the tiny Gram-negative anaerobic diplococci should be placed in the genus Veillonella.

The Committee wishes to emphasize that, in any classification dealing with groups and types within species (as, for example, with the meningococcus), the basis for such classification should be clearly stated. On the whole, division into primary groups has been made with univalent sera that have little or no cross activity under suitable test conditions. With this all will probably agree. If further detail of methods for accomplishing this should be discussed, it is hoped that opinions will be expressed freely; as for example, if slide agglutination, capsular swelling, or plate precipitation might be done, or if the conventional tube agglutination is to be relied upon.

3. Recommendations and plans for future work

Although they form a definite group, some meningococci of Group II alpha (proposed Group C) have a tendency to dissociate, and several widely separated laboratories have noted that some strains of this group tend to develop a "crossing" with Group I (Group A), Group II (Group B), or Group IV (Group D). This crossing is usually with one group only, and not with all. These cross-relationships should be investigated.

The Group IV (Group D) meningococci should also be studied if it is possible to obtain any fresh strains. Anyone encountering such strains is requested to send them either to Miss Cohen or to the Secretary, Dr. Branham.

Workers in this field should become more familiar with N. hemolysans. It is obtainable from the American Type Culture Collection.

The study of possible new species of Neisseria from animals should be continued.

BACTERIOLOGICAL NOMENCLATURE AND TAXONOMY

The genus Veillonella should be studied further and clarified in regard to species.

Any evidence that there are anaerobic members of the genus Neisseria should be carefully considered.

Dr. Pelczar has plans for several lines of future work in his laboratories. These include a continuance of his studies of variation in the fermentative capacity of the Neisseria. This project has received support from a USPHS Research Grant in Aid. He plans to use completely defined chemical media and also media supplemented with known compounds. The objective will be to account for fermentation discrepancies which occur in natural media. He also plans to gain information relative to the nutrition requirements of these organisms. Likewise, Dr. Pelczar wishes to make a study of pigmentation in relation to classification, if time and personnel permit. It is hoped that cultures from world-wide sources can be obtained to supplement the collection which he now has. Such cultures will be subjected to routine methods of examination for purposes of classification.

Other suggestions for further study of the Neisseria and of the Veillonella are cordially invited.

A list of the papers reporting work done in connection with this Committee is appended hereto.

Titles of Papers Published or in Press

Hajek, J.P., M.J. Pelczar, Jr., and J.E. Faber. Variations in the fermentative capacity of Neisseria. Am. Jour. Clin. Path. (In press).

Langford, G.C., J.E. Faber, and M.J. Pelczar, Jr. The occurrence of anaerobic Gram-negative diplococci in the normal human mouth. Jour. Bact. (In press).

Nemes, J.L., and M.J. Pelczar, Jr. Nutritional requirements of Neisseria other than N. meningitidis and N. gonorrhoeae. Proc. of Mtgs., Soc. Am. Bact. 1:9. 1948.

_____, _____, and R.N. Doetsch. Vitamin requirements of nonpathogenic Neisseria. (Submitted for publication March, 1950).

Pelczar, M.J., Jr., and R.N. Doetsch. On the direct fermentation of maltose. Science. 110:256. 1949.

_____, J.P. Hajek, and J.E. Faber. Characterization of Neisseria isolated from the pharyngeal region of guinea pigs. Jour. Inf. Dis. 85:239-242. 1949.

Warner, G.S., J.E. Faber, and M.J. Pelczar, Jr. A serological study of certain members of the nonpathogenic Neisseria group. Presented at the 50th General Meeting of S.A.B. May, 1950.

INTERIM REPORT OF THE SUB-COMMITTEE ON THE FAMILY NEISSERIACEAE

Presented in Rome, September 7, 1953

The first report of this Sub-Committee was presented at the 5th Congress in Rio during 1950. The principal recommendation made in this report was a proposed reclassification of Neisseria meningitidis according to the International Bacteriological Code of Nomenclature. The Proceedings of the Rio Congress have not been published as yet, so that bacteriologists working in this field have not had an opportunity to become familiar with this A, B, C, D nomenclature. This proposed classification will, however, appear in the forthcoming Seventh Edition of Bergey's Manual, with its relationship to previous classifications presented in tabular form. The Section on Neisseriaceae in this Seventh Edition of Bergey's Manual has been revised by Dr. Branham and Dr. Pelczar, and reviewed by Dr. Murray. Several other recommendations made by our Sub-Committee have been included.

Although the members of this Sub-Committee have been very busy with other projects of various sorts during the three years since the Rio Congress, all have maintained a lively interest in Neisseria with the result that this interim report contains appreciable progress along several lines.

Classification: Through the cooperation of the Institut Pasteur in Paris and the Institut Pasteur Annexe in Dordogne, 8 strains of meningococcus representing the Type C of Nicolle, Debains, and Jouan (1918) were received and studied by Dr. Branham. They were found to be very closely related to, and probably identical with, the group that has been designated during recent years as II alpha. Thus the designation of Group II alpha as Group C, as proposed by our Committee at the Rio Congress, seems fully justified.

Dr. Bensted has been making intensive effort to find strains of Type IV in order that a suitable study can be made.

BACTERIOLOGICAL NOMENCLATURE AND TAXONOMY

Dr. Pelczar has been searching for anaerobic Neisseriae but has found only strains that seem to be Veillonellae.

Epidemiology of Serologic Groups: Several members of the Sub-Committee have had access to newly isolated meningococci which they have typed. See table below:

	Period	I	II	IIa	IV	Unclassified	Total
Cohen	1950-52	1	29	20	--	3	53
Bensted	1952	15	75	--	--	--	90
Branham	1952-53	1	15	11	--	--	25

Incidence of meningococcal infection during 1952 and at present in the United States of America is higher than for the previous few years, although it cannot be said to have reached epidemic proportions. Group I, the usual epidemic strain, is conspicuously absent. Miss Cohen found one Group I strain in a total of 53 strains during these last 3 years, and Dr. Miller and Dr. Branham each encountered one such strain during 1952. In England, Group I has been more common, as Dr. Bensted found 15 strains of I and 75 of 2 during that year. The 2 strains which he obtained from the outbreak in Southern Sudan were of Group II. No strains of Type IV were encountered.

Maintenance: Preservation in a "lyophile" or "freeze-dried" state is so desirable that all workers are making every effort to keep their cultures in this way. Lack of facilities for this procedure handicapped Dr. Bensted's attempts to receive viable cultures from the Sudan. Dr. Prévot has observed that his collection of Veillonella strains has survived for a long period in such a "freeze-dried" state, whereas all of his strains of Neisseria that were stored by that method have been lost.

Metabolism and Nutritional Requirements: Both Dr. Thjøtta and Dr. Pelczar have given much attention to this phase of study. One of Dr. Thjøtta's assistants has been studying the metabolism of the meningococcus, and another has been investigating the "external" and "internal" antigens of the meningococcus by both immunological and physico-chemical means. This work is still in progress.

Dr. Pelczar's metabolic studies have dealt chiefly with N. gonorrhoeae, N. perflava and N. catarrhalis. He and his students have established that the compound putrescine is a

necessary growth substance for N. perflava; they have studied and reported the amino acid requirements for N. perflava and N. catarrhalis; and have shown that acetic acid and CO_2 represent the end products of glucose metabolism with N. perflava and that with minimal amounts of glucose complete oxidation is effected. In contrast N. gonorrhoeae was unable to oxidize acetate. The only amino acid oxidized by the gonococcus was glutamic acid.

Suggestions and plans for future work: Dr. Thjøtta and his assistants have begun a study of serological types of meningococci occurring in Norway. They have collected a number of strains, many from throat cultures, and have stored them in a "freeze-dried" state for future study. Dr. Thjøtta wishes to type his strains on the basis of American type sera, and Miss Cohen has offered to furnish these to him.

Dr. Pelczar plans a reexamination of the aerobic pigmented species of Neisseria (N. perflava, N. flava, N. subflava) with the idea of establishing a definite opinion as to the validity of species designations in this group. He would like to receive additional strains of N. subflava. Dr. Branham suggests that N. flavescens and N. hemolysans be studied with this group.

Other suggestions that have been made by both Dr. Murray and Dr. Pelczar are: 1) a search for anaerobic members of the genus Neisseria. Dr. Prévot's collection was destroyed during the war, and there are no cultures known to be in existence; 2) a search for Neisseria and Veillonella in animals other than man. 3) The examination of the validity of the named varieties of the two species of Veillonella is also suggested by Dr. Murray who feels that identification would be difficult on the basis of the characteristics described.

A suggestion comes from Miss Cohen that the Committee may wish to consider, in planning future studies, Dr. Hattie Alexander's work on the transformation of meningococcus types, published in Jour. Exper. Med., 1953, 97:797-806, "Indication of new type specificity of Neisseria meningitidis by desoxyribonucleic -acid-containing extracts." Miss Cohen has been especially interested in these studies because a number of years ago she noted a spontaneous occurrence of Group I microorganisms in a Group II strain in the course of experiments on the viability of meningococci in sodium chloride solutions.

BACTERIOLOGICAL NOMENCLATURE AND TAXONOMY

Subjects that were discussed during the Rome Congress:

All of the above suggestions for further work were discussed at the meeting of the Committee in Rome since, with the exception of Dr. Pelczar's plan for work with the pigmented Neisseria, the other proposed studies are neither planned nor assigned. Dr. Pelczar would like to hear the views of others regarding species designation in the aerobic pigmented group; i.e., does anyone have recent data which favors either the classification as presented in Bergey's Manual, or the concept of Wilson and Miles that these strains are all varieties of one species?

The desirability of designating some one place as a central "clearing house" for such cultures of the Neisseriaceae that seem to deserve study was emphasized at this meeting, and it was decided that such cultures be sent to Dr. Sara E. Branham at the National Institutes of Health, Bethesda 14, Maryland, U.S.A. Dr. Branham will receive these cultures, together with information concerning them, and assign them to those members of the Committee whose special field of interest is most nearly related to them. Thus valuable strains will not be lost just because no one knows where to find them. It is hoped that meningococci of the French Type D and of the Gordon-Murray Type IV may be found. Strains of N. subflava are especially needed for Dr. Pelczar's study of relations between the pigmented species, and it is desirable to find other strains of the N. hemolysans described by Dr. Thjøtta. Anaerobic Neisseria are especially wanted since the anaerobic Gram-negative cocci found by both Dr. Murray and Dr. Pelczar have all been Veillonellae. It was felt that a study of the species validity of the Veillonellae is indicated. Dr. Murray's recently isolated sheep strain of a Neisseria, and the N. caviae described by Dr. Pelczar definitely indicate further search for Neisseria in animals.

Considerable concern was expressed as to a reliable source of diagnostic sera for studies with these microorganisms. These are essential if comparative studies are to be made. At present there is no commercial source available.

The committee thinks that all of these proposed problems are well worthwhile. Those who can undertake work along these lines should be encouraged to do so.

Committee Members: E.G.D. Murray, Chairman, H.J. Bensted, R. St. John-Brooks, Sophia M. Cohen, S. T. Cowan, M.H. Gordon*, C.P. Miller, M.J. Pelczar, A.R. Prévot, Th. Thjøtta, Sara E. Branham, Secretary.

*Deceased, July 1953.

Minutes of Meeting of the Subcommittee on the Family Neisseriaceae

Rome, September 9, 1953

A meeting of the Subcommittee on the Nomenclature of the Neisseriaceae was held at the University of Rome at 2 P.M. on Wednesday, September 9, 1953, with Dr. E.G.D. Murray presiding. Those present were:

Chairman: Dr. E.G.D. Murray, Montreal, Canada

Members: Miss Sophia M. Cohen, Albany, N.Y., U.S.A.
Dr. C. Phillip Miller, Chicago, Ill., U.S.A.
Dr. A.R. Prévot, Paris, France
Dr. Th. Thjötta, Oslo, Norway

Secretary: Dr. Sara E. Branham, Bethesda, Md., U.S.A.

It was with great regret that those present heard Dr. Murray announce the death of Dr. Mervyn H. Gordon which occurred during July. Although well past 80 years, Dr. Gordon was actively interested in the work of our committee, and wrote during May to express his regrets at not being able to attend the Rome Congress. We will miss his encouragement very much.

Matters that had been suggested for discussion were taken up in turn.

Dr. Murray had previously read our Committee Report before the Section on Taxonomy on Monday morning, September 7. This report, as well as a copy of our previous Rio Congress report proposing our new classification of meningococci, has now been sent to Dr. R.E. Buchanan in order that the material may be published in the International Bulletin of Bacteriological Nomenclature and Taxonomy of which he is Editor-in-Chief.

The section of our 1953 report giving the distribution of serologic groups of meningococcus stimulated some discussion as to whether an epidemic of cerebrospinal meningitis is necessarily preceded by an increase in the occurrence of Group I strains of meningococcus. Needless to say this question remained unanswered for the present.

BACTERIOLOGICAL NOMENCLATURE AND TAXONOMY

Dr. Thjøtta reported that he and his assistants are studying the type occurrence among meningococci in Norway. They have collected a number of strains from throat cultures and have stored them for further study in a "freeze-dried" state. He expressed the wish that American sera could be used for this typing in order that the results might be comparable with other studies in type distribution that have been made during recent years.

One of Dr. Thjøtta's assistants, Dr. Steen, will soon publish a report of his work on the basic nutritional requirements of the meningococcus. Another is studying various techniques for doing agglutination tests.

The desirability of designating some one place as a central "clearing house" for those cultures of the Neisseriaceae that seem to deserve study was emphasized, and it was decided that such cultures be sent to Dr. Sara E. Branham at the National Institutes of Health, Bethesda 14, Maryland, U.S.A. Dr. Branham will not study these cultures herself but will receive them, together with information concerning them, and assign them to those members of the Committee whose special field of interest is most nearly related to them. Thus valuable strains will not be lost just because no one knows where to send them. It is hoped that meningococci of the French Type D and of the Gordon-Murray Type IV may be found. Strains of Neisseria subflava are especially needed for Dr. Pelczar's study of relations between the pigmented species, and it is desirable to find other strains of N. hemolysans described by Dr. Thjøtta. Anaerobic Neisseria are especially wanted, since the anaerobic Gram-negative cocci found by both Dr. Murray and Dr. Pelczar have all been Veillonellae.

Considerable concern was expressed as to a reliable source of diagnostic sera for studies with all these microorganisms. The acute phase of this problem with the meningococcus has been solved by an offer from Miss Cohen to send diagnostic sera for Groups I, II, and II alpha (our proposed A, B, and C) meningococci to members of the Committee. This is not a public offer as Miss Cohen's supply of sera is limited, but the provision for reliable and uniform sera for members of the Committee is indeed a valuable contribution to the work of our group.

Dr. Prévot expressed a wish that our Committee could send a young person to work with him at the Institut Pasteur

in Paris for a year in order to become familiar with his methods of study. He feels that the anaerobic Neisseriae which he has described are so delicate that it is extremely difficult to send them to other laboratories. He has wished to extend this invitation before, but has been handicapped by the lack of funds for the young person's expenses.

It was suggested that it might be quite feasible for the said young person, if sufficiently well qualified, to obtain a fellowship to defray his expenses. Several practical sources for such a fellowship were suggested. This would be an excellent opportunity for someone and names of possible candidates were mentioned.

Specific problems to be undertaken were next discussed, especially in relation to classification. It was felt that a study of the species validity of the Veillonellae was indicated. Dr. Prévot suggested that the taxonomic position of N. vulvovaginitis" be allowed to "ride along" for a while until someone could have time to study it. Some discussion was also given to the N. winogradski recently reported by De Mello. Dr. Prévot thinks it falls into the genus Neisseria, but says that 2 other laboratories have reported it as Moraxella and Mima respectively. According to Dr. Prévot cultures of this N. winogradski can be obtained from Professor Lemoigne, Chief, Service of Fermentations, Institut Pasteur, Paris XV, France.

Dr. Murray's recently isolated sheep strain of Neisseria, and the N. caviae described by Dr. Pelczar definitely indicate further search for Neisseria in animals.

Miss Cohen had previously suggested the desirability of following up the transformation of type in meningococci as described by, Alexander and Redman. This work has been published (Jour. Exp. Med., 97:797. 1953) "Transformation of type specificity of meningococci: change in heritable type induced by type-specific extracts containing desoxyribonucleic acid").

The Committee thinks that all of these proposed problems are well worthwhile. So far, no one has expressed any definite intention of undertaking any one of them. It is hoped that members of our group who can work along these lines, or who can find someone who would like to follow them up, will do so.

Sara E. Branham, Secretary

INTERNATIONAL BULLETIN OF BACTERIOLOGICAL NOMENCLATURE AND TAXONOMY
Volume 4 April 15, 1954 No. 2 pp 109-114

REPORT OF THE SUBCOMMITTEE ON VIRUSES (1953)

The Virus Subcommittee of the International Nomenclature Committee met in Rome on the 8th and 9th September, 1953. There were present:-

Dr. C.H. Andrewes (Chairman)
Dr. F.C. Bawden
Dr. C.W. Bennett
Dr. G.H. Bergold
Dr. S. Gard
Prof. G. Henneberg
Dr. E. Köhler
Prof. F. Magrassi
Dr. I.W. Prentice
Dr. G. Rake
Prof. T.H. Thung
Prof. E. van Slogteren
Dr. H. Koprowski (alternate for Sir Macfarlane Burnet)
Dr. J.R. Paul (alternate for Dr. W. McD. Hammon)
Dr. A.B. Sabin (alternate for Dr. P. Lepine)

The Subcommitte unanimously reported to the main committee as follows.

After studying reports of the study groups appointed in 1950 and 1952 they decided to reiterate the conclusions of the meeting in 1950 that at present "the use of systems of classification for and the application of binomials to viruses as a whole are undesirable and should be discouraged". They also recommended that the starting date for valid Linnean nomenclature for viruses should not yet be determined and that until this was done names for viruses already proposed should have no standing in bacteriological nomenclature.

They proposed that names suggested by study groups of the subcommittee be accepted after further study as names for provisional international usage. These names were not proposed as binomial names of Linnean type as no grouping beyond the equivalent of the generic level is possible at the moment. They further recommended that no other names than those proposed by the study groups and accepted by the committee should have any official status.

The study groups for the bacteriophages and for arthropod-borne encephalitides did not consider that viruses in their groups were ripe for application of binomials.

The Chlamydozoaceae group recommended that this group be considered as belonging to the Rickettseales; the report was accepted and the group will thus be now considered together with bacteria and will be outside the purview of the virus subcommittee.

The other reports were accepted with some modifications and the following names of groups and members were proposed (groups and members are equivaldnt to genera and species in the Linnean system):

Herpesvirus	hominis	(herpes simplex virus)
"	suis	(pseudorabies)
"	simiae	(B virus)
"	cuniculi	(Virus III)
"	varicellae	(varicella)
Poxvirus	variolae	(smallpox)
"	officinale	(vaccinia)
"	bovis	(cow-pox)
"	muris	(ectromelia, mouse-pox)
"	avium	(fowl-pox)
"	mollusci	(molluscum contagiosum)
"	myxomatis	(rabbit myxoma)
Poliovirus	hominis	(human poliomyelitis)
"	muris	(mouse encephalomyelitis, TO type)
Myxovirus	influenzae-A	
"	" -B	
"	" -C	
"	pestis-galli	(fowl plague)
"	multiforme	(Newcastle disease)
"	parotitidis	(mumps)

Insect-pathogenic viruses

Polyhedrovirus bombycis
and 6 other group members (efficiens, reprimens, olethrium, campeoles, percemptor, fumiferanae)

Capsulavirus calyptum
and 5 other group members (daboium, latheticum, thompsonium, clistorhabdion, brassicae and nosodes).

Globovirus rotundum

Moratorvirus nudum.

BACTERIOLOGICAL NOMENCLATURE AND TAXONOMY

The group members are as described by Bergold and by Steinhaus (Ann. N.Y. Acad. Sci. 56:495, 517. 1953).

These non-Linnean names shall not have ascription to particular authors, nor shall the equivalent of type species be designated. However, type strains shall be deposited with appropriate culture collections. All these names with the suffix "-virus" will be of the neuter gender. Italics should be used for the names in scientific papers. Capital letters should be used for groups.

It is suggested that the list of group members should be published in the International Bulletin of Nomenclature and should be added to or revised from time to time; also that the included groups and group members should be described in scientific journals - the descriptions being furnished by study groups and approved by the virus subcommittee. It is not proposed to create any new study groups immediately but to await the results of the present proposals.

C. H. Andrewes,
Chairman

MEMBERS OF THE VIRUS SUBCOMMITTEE OF THE INTERNATIONAL NOMENCLATURE COMMITTEE

Animal Viruses

Dr. C.H. Andrewes (Chairman)
National Institute for Med. Res.
The Ridgeway,
Mill Hill, London, N.W. 7, Eng.

Dr. G.H. Bergold,
Laboratory of Insect Path.
P.O. Box 490,
Sault Ste. Marie,
Ontario, Canada

Sir Macfarlane Burnet, F.R.S.,
Walter and Eliza Hall Institute,
Royal Melbourne Hospital,
Parkville N2, Melbourne,
Australia.

Dr. Sven Gard,
Dept. of Virus Research,
Karolinska Institutet,
Box 764
Stockholm 1, Sweden

Dr. W. McD. Hammon,
Dept. of Epidemiology,
Grad. Sch. of Pub. Health,
University of Pittsburgh,
Pittsburgh 13, Pa., USA.

Prof. G. Henneberg,
Robert Koch Inst. für Hyg.
Föhrerstrasse 2,
Berlin N65, Germany

Dr. P. Lepine,
Institut Pasteur,
25 Rue du Docteur Roux,
Paris XV^{e}, France

Prof. F. Magrassi,
Instituto di Patologia Medica,
Universita di Napoli,
Piazza L. Miraglia,
Napoli, Italy.

Dr. J. Ørskov,
Statens Seruminstitut,
Amager Boulevard 80,
Copenhagen, Denmark.

Dr. G. Rake,
E.R. Squibb and Sons,
Squibb Building,
745 Fifth Avenue
New York 22, N.Y. USA.

Plant Viruses

Dr. L.M. Black,
Department of Botany,
University of Illinois
Urbana, Ill., USA.

Dr. A. Bitancourt,
Instituto Biologico,
Caixa Postal 119-A,
São Paulo, Brazil

Dr. P. Limasset,
Station Centrale de Path. Veg.
Route-de-St. Cyr,
Versailles, France

Dr. C.W. Bennett,
Sugar Plant Investigations,
U.S. Dept. of Agric.
P.O. Box 31,
Riverside, Calif., USA.

Dr. I.W. Prentice,
Plant Pathology Lab.
Ministry of Agr. and Fish.
Milton Road,
Harpenden, Herts.,
England

Dr. F.C. Bawden, F.R.S.,
Dept. of Plant Pathology,
Rothamsted Exp. Sta.
Harpenden, Herts.
England

Dr. E. Köhler,
Institut für Virusforschung,
Dörnbergstrasse 25/27,
Celle, Germany

Prof. T.H. Thung
Institut voor Planten-
ziektenkundig Onderzoek,
Binnenhaven 4a,
Wageningen, Holland

Dr. F.P. McWhorter,
Botany and Plant Pathology
Department,
Oregon State College,
Corvallis, Ore., USA.

Prof. E. van Slogteren,
Laboratorium voor
Bloembollen-Underzoek,
Lisse, Holland

BACTERIOLOGICAL NOMENCLATURE AND TAXONOMY

Bacterial Viruses

Dr. J. Craigie, O.B.E., F.R.S.,
Imperial Cancer Research Fund Laboratories,
Burtonhole Lane,
Mill Hill, London, N.W. 7., England

MEMBERS OF THE SUBSECTIONS OF THE VIRUS SUBCOMMITTEE

Arthropod-borne Encephalitis Viruses

Dr. P. Lepine
(see Animal Viruses)

Dr. W. McD. Hammon
(see Animal Viruses)

Dr. P.K. Olitsky,
Rockefeller Institute for
Medical Research,
66th St. and York Ave.,
New York 21, N.Y. USA.

Influenza Group

Dr. C.H. Andrewes and
Sir Macfarlane Burnet
(see Animal Viruses)

Dr. F.B. Bang,
The Johns Hopkins Hosp.,
Baltimore 5, Md., USA.

Insect-pathogenic Viruses

Dr. G.H. Bergold
(see Animal Viruses)

Dr. E.A. Steinhaus,
Laboratory of Insect Path.
Div. of Biol. Control,
College of Agriculture,
Berkeley, Calif., USA.

Dr. G.R. Wyatt,
Laboratory of Insect Path.
P.O. Box 490
Sault Ste. Marie,
Ontario, Canada

Dr. K.M. Hughes and
Dr. F.T. Bird,
c/o Dr. G.H. Bergold.

Phage Group

Dr. J. Craigie (see Bacterial Viruses)

Dr. M.H. Adams,
Dept. of Microbiology,
University of New York,
New York, N.Y. USA.

Dr. P. Nicolle,
Institut Pasteur,
25 Rue du Docteur Roux,
Paris, XV^{e}, France

Pox Group

Sir Macfarlane Burnet
(see Animal Viruses)

Dr. E.W. Goodpasture,
Dept. of Pathology,
Vanderbilt University,
Nashville, Tenn., USA

Dr. E.S. Horgan
Virus Research Institute,
P.O. Box 49,
Entebbe, Uganda,
East Africa

Psittacosis-lymphogranuloma Group

Dr. G. Rake
(see Animal Viruses)

Prof. S.P. Bedson, F.R.S.,
The Middlesex Hospital
London, W.1, England

Prof. R. Gönnert,
Chemotherapeutisches
Laboratorium der
Farbenfabriken Bayer,
Wuppertal-Elberfeld,
Germany

Poliomyelitis Group

Dr. J.H.S. Gear,
South African Institute for
Medical Research,
Hospital Street,
Johannesburg, South Africa

Dr. H. von Magnus,
Statens Seruminstitut,
Amager Blvd. 80,
Copenhagen, Denmark

Dr. J.R. Paul,
Section of Preventive Med.
Yale University School of
Medicine,
333 Cedar Street,
New Haven 11, Conn.,
U.S.A.

Herpes Group

Dr. C.H. Andrewes
(see Animal Viruses)

Dr. A.B. Sabin,
The Children's Hospital
Research Foundation,
Univ. of Cincinnati, Coll. Med.
Elland and Bethesda Avenues
Cincinnati 29, Ohio, USA.

Dr. T.F. McN. Scott,
Children's Hospital,
1740 Bainbridge Street,
Philadelphia 47, Pa., USA.

Dr. T.M. Rivers,
Hosp. of Rockefeller Inst.
66th St., and York Ave.,
New York 21, N.Y., USA.

INTERNATIONAL BULLETIN OF BACTERIOLOGICAL NOMENCLATURE AND TAXONOMY
Volume 4 April 15, 1954 No. 2 pp. 115-117

REPORT OF THE SUBCOMMITTEE ON LEPTOSPIRA

Subculturing, Registration and Storage of Cultures of Leptospires at the Leptospira Laboratory, Institute of Tropical Hygiene and Geographical Pathology, Amsterdam.

Culture Medium:

Modified Vervoort's medium with and without rabbit serum/haemoglobin.

Storage:

In small tubes (100 x 9 mm) containing approximately 3 ml. medium and cotton-wool stoppered. For agglutination tests larger tubes with 10 ml. medium are added.

The collection is stored at room temperature in the dark in a cupboard. Several consecutive subcultures of each strain are stored together in numbered wire containers (hereafter named "stock container") which have fixed numbered and indexed places in the cupboard. Each stock container holds 7-8 sets of subcultures of the same strain, together with index cards for each set of subcultures.

Subculturing:

As a rule a fixed day of the week is assigned for control and subculturing of a part of the standard collection of strains. Control is established by dark-field examination of a drop of culture (without cover glass, x 20 objective and x 10 ocular, enlargement 200) of the most recent subcultures of the strain. If copious growth is observed, the stock container is set aside on the bench and a small wire container is added in which are placed two tubes of fresh medium, one with, the other without serum/haemoglobin. If growth in the latest subculture is insufficient, older sets of subcultures in the stock container are examined, and a tube showing good growth is chosen for subculturing.

NB. This is the second control of growth, the first had been made after 4 days incubation at 32° C. before the tube had been added to the tubes in the stock container at room temperature.

Registration:

A system of double registration is maintained, which is controlled independently by one of the assistants who has not written up the register and index cards.

(a) A General Register is kept in which on each day of subculturing all data on strains and subculturing are entered. Tubes with fresh medium are numbered 1-1000 consecutively and when this last number has been reached, the numbering again starts at 1. Against each tube-number the following details are entered:- name of strain, ordinal number of this subculture, and the tube-number of the culture from which the subculture is made (see example).

Then from these entries index cards are made, one card for each strain to be subcultured.

(b) Index Cards are differently colored according to the origin of the strain:-

Human strains - red or orange:
Dog strains - yellow:
Rat/mice strains - white:
Water strains (saprophytic) - blue: (see example).

The index cards contain data on the fate of the culture in the two tubes of each strain. They are placed, together with the two tubes of fresh medium, in a small wire container next to the stock container. When the tubes have been inoculated, the small containers (card and two tubes) are placed in the incubator at 32°C. and, four days later when growth is apparent, the two tubes with corresponding index card are added to the stock container of this particular strain in the cupboard. The work is done ordinarily by one assistant and two helpers who, during the period of subculturing, are not engaged in other work.

In summary the following steps are carried out:-

1. Stock containers of various strains are taken out of the cupboard and placed on the bench. Each week about 70-80 strains are controlled and subcultured, and care is taken that each strain in the collection is subcultured once in every three weeks.
2. A number of recent subcultures of each strain are examined microscopically. The numbers of the tubes, showing good growth and chosen for subculturing, are entered in the General Register. From the entry in the Register, index cards are made, one for each strain. The cards and the sets of two tubes with new medium are placed in small containers beside the stock container of the corresponding strain.

3. Subculturing is done by three persons: one flames the sterilized Pasteur pipettes; the second presents the old culture and the tubes of fresh medium to the third who, by means of the pipette, inoculates each tube with approximately 0.5 ml. of the culture.
4. The old culture is put back in to the appropriate stock container which is returned to the cupboard, and the newly inoculated tubes with index cards are incubated for 4 days at 32°C. After 4 days, when growth is observed, the two tubes and index cards are added to the stock container of the strain in the cupboard.
5. Before subcultures of strains are sent out, control of growth and a serological examination of the serotype are carried out. Alternatively, after serological verification, the culture is subcultured into tubes of fresh medium which are dispatched directly.

Example of Part of General Register

	Date of Subculturing: 22 May 1953.		
Tube No:	Strain:	Subculture No:	From tube No:
300			
301			
302	Rachmat	257	72
303	Rachmat	257	72
304			
305			

Example of Index Card

Strain:	Rachmat	Subculture No:	257
Subcultured:	22.5.53	From tube No:	72

Medium	Tube	Date of Control	Date of Subculture
Serum	302		
Peptone	303		

INTERNATIONAL BULLETIN OF BACTERIOLOGICAL NOMENCLATURE AND TAXONOMY
Volume 4 April 15, 1954 No. 2 pp. 119-124

A REVIEW OF NAMES FOR COLIFORM ORGANISMS

S. T. Cowan
National Collection of Type Cultures, London, England

Nomenclature takes second place to taxonomy; the correct name of an organism can only be determined after its taxonomic position has been settled. There are several nomenclatural problems relating to the members of the family Enterobacteriaceae (the name is used without prejudice) but it is proposed to discuss here only those of the coli-aerogenes groups.

The taxonomic solutions offered by the Enterobacteriaceae Subcommittee (Reports to the Nomenclature Committee presented at the V and VI International Congresses of Microbiology) divide these organisms into two main groups: (1) the Escherichia group, which contains Bacterium coli commune Escherich, Bacterium freundii Braak, Bacillus alkalescens Andrewes, Bacillus dispar Andrewes, Salmonella ballerup Kauffmann and Møller, Salmonella hormaechei Monteverde, and the Bethesda group of Edwards, West and Bruner; and (2) the Klebsiella group containing Friedländer's Pneumoniecoccus, Klebsiella rhinoscleromatis Trevisan, Bacillus mucosus ozaenae Abel, Bacterium lactis aerogenes Escherich. The reports did not suggest that Bacillus cloacae Jordan should be included in the Klebsiella group, and Kauffmann (1953) has proposed that the separate genus, Cloaca Castellani and Chalmers 1919 should be recognized.

The correct generic and specific names for organisms in these groups are important, not only to those who teach bacteriology or write about bacteria, but to all bacteriologists, and I shall discuss each in turn.

The Escherichia Group (Enterobacteriaceae Subcommittee)

This is the genus Escherichia Castellani and Chalmers 1919. Of its type species, E. coli, the Bergey Manual (1948) lists the following synonyms:

Escherichia coli (Migula) Castellani and Chalmers 1919
- Bacterium coli commune Escherich, 1885
- Bacillus escherichii Trevisan, 1889
- Bacillus coli communis Sternberg, 1893
- Bacillus coli Migula, 1895
- Bacterium coli Lehmann and Neumann, 1896

Bacillus coli verus Durham, 1900
Bacillus coli communis verus Durham, 1900
Aerobacter coli Beijerinck, 1900
Bacillus coli-communis Winslow, Kligler and Rothberg, 1919
Bacterium coli-communis Holland, 1920
Colobactrum coli Borman, Stuart and Wheeler, 1944

From this formidable list it appears that the specific epithet, derived from the first binomial, Bacillus escherichii Trevisan, should be escherichii. The generic name will depend on the solution offered to the taxonomic problems. On the assumption that the lactose-fermenting coliforms are divided into two groups, as suggested by the Enterobacteriaciae Subcommittee, and that each group is given generic rank, the generic names to be considered for the Escherichia group are Aerobacter, Escherichia and Colobactrum. (Bacillus and Bacterium have been dealt with in Official Opinions of the Judicial Commission and are not available for the coliform bacteria.)

Aerobacter aerogenes, which was listed by Beijerinck (1900) as the first species of the genus, is generally regarded as the type of Aerobacter. Aerobacter coli was the third species in Beijerinck's list. In its report to the 1953 Congress the Enterobacteriaceae Subcommittee placed Klebsiella pneumoniae and Aerobacter aerogenes together in their Klebsiella group. This makes the generic name Aerobacter a synonym of Klebsiella with another type species. Should Aerobacter again be segregated as a genus, its type species would be A. aerogenes. It would probably be unwise for the Judicial Commission, acting on the authority of Rule 15 as amended at the Rome Congress, to conserve the generic name Aerobacter based on another type species. It is wholly unlikely that the Commission would conserve the generic name Aerobacter with Bacterium coli commune Escherich as type species, because the new combinations Aerobacter escherichii or Aerobacter coli would be a constant source of confusion. The only reason for conservation of a name as an exception to the principle of priority is common usage. Such conservation of a commonly used name is only likely to be made when the valid name (i.e. the correct name according to the rules) is one that has never been taken into general use.

Thus we can reject the generic names Bacterium, Bacillus and Aerobacter for Escherich's Bacterium coli commune, and select Escherichia Castellani and Chalmers, 1919, which antedates Colobactrum Borman, Stuart and Wheeler, 1944.

Under the rules Escherichia escherichii seems to be the correct name for the type, but it is a combination that apparently has never been used, and to substitute the epithet escherichii for coli would be a source of confusion. Principle 1 (2) of the code allows us "to reject the use of forms and names which may cause error or ambiguity or throw science into confusion" and it is my view that the combination Escherichia escherichii should be barred from use by placing the epithet escherichii in the list of nomina specifica rejicienda, and at the same time conserving the generic name Escherichia C. and C. with the type Escherichia coli (Migula) C. and C.

The Klebsiella Group (Enterobacteriaceae Subcommittee)

In the development of this discussion I am assuming that Bacterium lactis aerogenes Escherich is retained as a separate species in the same genus as Friedlander's bacillus, and that Bacillus cloacae Jordan is excluded from the Klebsiella group. The generic name will be Klebsiella Trevisan, 1885, which antedates Aerobacter Beijerinck, 1900, and which was approved for conservation at Rome. For Bacterium lactis-aerogenes the Bergey Manual (1948) lists the following synonyms:

Aerobacter aerogenes (Kruse) Beijerinck, 1900
Bacterium lactis aerogenes Escherich, 1885
Bacterium lactis Baginsky, 1888
(not Bacterium lactis, Lister, 1873)
Bacterium aceticum Baginsky, 1888
Bacillus lactantium Trevisan, 1889
Bacillus lactis aerogenes Sternberg, 1893
Bacillus aerogenes Kruse, 1896
(not Bacillus aerogenes Miller, 1886)
Bacterium aerogenes Chester, 1897
(not Bacterium aerogenes Miller, 1886)
Encapsulatus lactis-aerogenes C. and C., 1919
(Encapsulata) Bacillus aerogenes Perkins, 1925
Colobactrum aerogenes Borman, Stuart and Wheeler, 1944

The first binomial, Bacterium lactis Baginsky is a later homonym of Bacterium lactis Lister, and hence invalid. The epithets of the second and third binomials, Bacterium aceticum Baginsky and Bacillus lactantium Trevisan, have never been taken into general use. To retain the fourth epithet, aerogenes, it will be necessary to have either (a) aerogenes conserved against any earlier name or (b) to place the epithets lactis, aceticum and lactantium in the list of nomina specifica rejicienda. The first alternative is obviously the better in case further research shows an earlier name in some obscure publication.

The following synonyms are listed for Friedländer's bacillus:

Klebsiella pneumoniae (Schroeter) Trevisan, 1887
- Bacterium pneumoniae crouposae Zopf, 1885
- Klebsiella crouposa Trevisan, 1885
- Hyalococcus pneumoniae Schroeter, 1886
- Bacillus pneumoniae Flügge, 1886
- Klebsiella friedlanderi Trevisan, 1889
- Bacillus mucosus capsulatus Paulsen, 1893
- Bacterium pneumoniae L. and N., 1896
- Bacterium pneumonicum Migula, 1900
- Bacillus friedlanderi Macé, 1901
- Encapsulatus pneumoniae C. and C., 1919
- Coccobacillus friedlanderi Neveu-Lamaire, 1921
- Proteus pneumoniae Weldin, 1926
- Bacterium friedlander Weldin, 1926
- Bacillus mucosus-capsulatus Mason and Beattie, 1928

It could be argued that Zopf's name should be retained as it is binomial, Bacterium pneumoniae-crouposae, the bacterium of croupous pneumonia, with a single epithet. If Zopf's name is rejected the earliest binomial was Klebsiella crouposa Trevisan, 1885. Four years later Trevisan himself rejected the epithet crouposa and substituted friedlanderi for it. Meanwhile, in 1886, both Schroeter and Flügge had used the epithet pneumoniae. Common usage would support both pneumoniae and friedlanderi as specific epithets for the type species, and, as neither is the correct epithet, either could be chosen if an exception is to be made. It is my view that friedlanderi (or more correctly friedlaenderi) would be the better because such a name would not suggest an association with the disease pneumonia.

The Cloaca Group

If a Cloaca group is distinguished a suitable generic name should be found for it. The Bergey Manual lists the following synonyms, but Bacillus and Bacterium are not available.

Aerobacter cloacae (Jordan) Bergey, 1923
Bacillus cloacae Jordan, 1890
Bacterium cloacae L. and N., 1896
Bacillus lactis cloacae Conn, Esten and Stocking, 1906
Cloaca cloacae C. and C., 1919 (the Bergey Manual reference should be corrected to Manual of Tropical Medicine, 3rd ed., p. 958.

The nomenclatural problem here depends on the eventual taxonomic solution. If all motile strains with the IMViC reactions - - + + are to be included in the same genus, conservation of Aerobacter (not Aerobacter Beijerinck) with A. cloacae as the type might be proposed (Rule 15 as amended at Rome would allow this). If this were done the conserved genus would be described as Aerobacter gen. cons. (not Aerobacter Beijerinck), but a genus so named, but not including A. aerogenes (which I have assumed will become Klebsiella aerogenes), would be a source of confusion. The Commission would probably prefer not to conserve Aerobacter with A. cloacae as the type, but it might be willing to conserve the generic name next in order of priority, Cloaca Castellani and Chalmers.

Discussion

We have seen that the Bergey Manual, following common usage, has rejected the earliest specific epithets, escherichii, lactis and crouposa in favor of coli, aerogenes and pneumoniae. Such irregularities should not be condoned unless we are prepared to take action and ask the Judicial Commission to issue Official Opinions on these names. It might be argued that it is unnecessary to conserve these or any other specific names but I suggest that the only way to achieve stability in bacterial nomenclature is to conserve the names of these type species and to designate nomenclatural types. Work is in hand for the selection of a type strain for Bacterium coli commune Escherich, and a directive from the Judicial Commission would set in motion the selection of the other type strains. It is desirable, therefore, that the Judicial Commission should be asked to pass Opinions on the names used for the bacteria we have considered.

1A. That an opinion be issued on the validity of the generic name Escherichia Castellani and Chalmers, 1919, and that if it is found valid that it be placed in the list of nomina generica conservanda, with the type Escherichia coli (Migula) Castellani and Chalmers, and action taken to designate a type culture of the species E. coli.

1B. That the specific epithet escherichii be placed in the list of epitheta specifica rejicienda.

2A. That an Opinion be issued on the correct name for the type species of the genus Klebsiella Trevisan, 1885, and that action be taken to designate a type culture.

2B. That the specific epithet aerogenes be conserved against all earlier epithets which have been used in synonyms of Bacterium lactis aerogenes Escherich, 1885.

3A. That the Commission should consider whether Aerobacter Beijerinck, 1900, should be placed in the list of nomina generica rejicienda. The Commission should be asked to determine whether a new genus Aerobacter (not A. Beijerinck) should be conserved with the type A. cloacae Jordan, nov. comb., or with a redefined (motile) species A. aerogenes, or whether the genus Cloaca C. and C., 1919, should be conserved.

3B. That action be taken to designate a type culture of the species chosen under 3A, i.e. A. aerogenes (redefined), A. cloacae, or Cloaca cloacae.

REFERENCES

Beijerinck, M.W. Z. Bakt. (II Abt.) 6:193. 1900.

Bergey's Manual of Determinative Bacteriology. 6th ed. Edited by R.S. Breed, E.G.D. Murray and A.P. Hitchens. 1948.

Borman, E.K., C.A. Stuart and K. M. Wheeler. J. Bact. 48:351. 1944.

Castellani, A. and A.J. Chalmers. Manual of Tropical Medicine, London: Baillière, Tindall and Cox. 1919.

Enterobacteriaceae Subcommittee Report presented to the Nomenclature Committee at the V International Congress for Microbiology, 1950. Int. Bull. Bact. Nomen. Tax. 4:1. 1954a.

_____ ... VI International Congress for Microbiology, 1953. Int. Bull. Bact. Nomen. Tax. 4:1. 1954b

Kauffmann, F. Riv. Ist. sieroter. ital. 28:485. 1953.

INTERNATIONAL BULLETIN OF BACTERIOLOGICAL NOMENCLATURE AND TAXONOMY
Volume 4 April 15, 1954 No. 2 pp. 125-128

MEMORANDUM ON THE NOMENCLATURE OF THE PNEUMOCOCCUS GROUP

F. Kauffmann and E. Lund
Statens Seruminstitut, Copenhagen
(Chief: J. Ørskov, M.D.)

Today we have 2 different systems of nomenclature for the designation of serological types or serotypes of pneumococci: The first nomenclature which was published in 1940 by Kauffmann, Mørch and Schmith, followed Cooper's nomenclature which was retained, but expanded. New types serologically related to one of Cooper's types were gathered into one group; for example Group 7 consists of Types 7, 7A, 7B, and 7C which have one or more antigens in common. This grouping of related types was undertaken for practical reasons in order to simplify diagnosis and therapy.

In 1941 Walter and co-workers in New York described several new types and accepted the classification of Kauffmann, Mørch and Schmith.

The second nomenclature was published in 1944 by Eddy. She rejected the classification of Kauffmann, Mørch, and Schmith and gave the various types consecutive numbers, regardless of the antigenic structure.

Against the proposal of Eddy the following facts may be advanced:

1) According to the International rules of nomenclature, it is not permissible arbitrarily to alter already published names of bacterial types, for example to call Kauffmann, Mørch, and Schmith's Type 7C Type "50". For reasons of priority (1940 against 1944), the first name, "7C", must be retained.

2) Apart from these formal but binding reasons, from a scientific point of view it is preferable when dealing with a type closely related to Cooper's Type 7 to name it "Type 7C", rather than give it a new number.

3) In the preparation of diagnostic and therapeutic immune sera it is advisable to gather the related types into group sera. Then, according to circumstances, it will be possible to make a group diagnosis or an exact type diagnosis.

The fact that there is a practical demand for such a grouping is also clear from the fact that Eddy herself puts several types into groups. That being so, why not undertake this

Diagnostic Antigenic Schema of the Pneumococcus Group
(Kauffmann - Mørch - Schmith S chema)

Type	Antigens	Type	Antigens
1	1a	20	20a, 20b, 7g
2	2a	21	21a
3	3a	22	22a, 22b
4	4a	22A	22a, 22c
5	5a	23	23a, 23b, 18b
6A	6a, 6b	23A	23a, 23c, 15a
6B	6a, 6c	23B	23a, 23b, 23d
7	7a, 7b	24	24a, 24b, 24d, 7h
7A	7a, 7b, 7c	24A	24a, 24c, 24d
7B	7a, 7d, 7e, 7h	24B	24a, 24b, 24e, 7h
7C	7a, 7d, 7f, 7g, 7h	25	25a, 25b
8	8a	27	27a, 27b
9A	9a, 9c, 9d	28	28a, 28b, 16b, 23d
9L	9a, 9b, 9c, 9f	28A	28a, 28c, 16b,23d
9N	9a, 9b, 9e	29	29a, 29b, 13b
9V	9a, 9c, 9d, 9g	31	31a, 20b
10	10a, 10b	32	32a, 27b
10A	10a, 10c, 10d	32A	32a, 32b, 27b
11	11a, 11b, 11e	33	33a, 33b, 33d
11A	11a, 11c, 11d, 11e	33A	33a, 33b, 33d, 20b
11B	11a, 11b, 11f	33B	33a, 33c, 33d, 33f
12	12a, 12b	33C	33a, 33c, 33e
13	13a, 13b	34	34a, 34b
14	14a	35	35a, 35b, 34b
15	15a, 15b, 15c, 15f	35A	35a, 35c, 20b
15A	15a, 15c, 15d, 15g	35B	35a, 35c, 29b
15B	15a, 15b, 15d, 15e, 15h	35C	35a, 35c, 20b, 42a
15C	15a, 15d, 15e	36	36a, 9e
16	16a, 16b, 11d	37	37a
17	17a, 17b	38	38a, 25b
17A	17a, 17c	39	39a, 10d
18	18a, 18b, 18c, 18f	40	40a, 7g, 7h
18A	18a, 18b, 18d	41	41a
18B	18a, 18b, 18e, 18g	42	42a, 20b, 35c
18C	18a, 18b, 18c, 18e	43	43a
19	19a, 19b, 19d	44	44a, 44b, 12b
19A	19a, 19c, 19d	45	45a
19B	19a, 19c, 19e, 7h	46	46a, 44b
19C	19a, 19c, 19f, 7h		

The table contains 44 types or groups.

grouping according to Kauffmann, Mørch, and Schmith's antigenic schema, which shows the natural relationships of the various types?

4) Experience extending over several years proved the suitability of the Danish nomenclature. The division into groups is not artificial but corresponds to the natural conditions. Whereas some types like 1 and 2, show a pronounced serological specificity, others, such as the types in Group 7, have strongly developed common capsular antigens and thus form a natural group.

Another argument in support of subdividing the pneumococci into groups of serologically related types is to be found in the fact that there are antigens common to certain groups of pneumococci and other kinds of bacteria.

For example, Kauffmann and Langvad-Nielsen demonstrated antigens common to one type of Salmonella (S. kirkee) and all the types in pneumococcus Group 35. Similarly, Mørch found antigens common to two strains of non-haemolytic streptococci and the pneumococcus Groups 19 and 24. Furthermore, Mørch and Knipschildt demonstrated antigens common to a coli strain and pneumococcus Group 9.

5) The State Serum Institute, Copenhagen, is today the only institute manufacturing and distributing all diagnostic pneumococcus sera. Since January 1, 1942, the Danish sera have been supplied to institutes in most of the countries of Europe. These pneumococcus sera are designated by the Danish nomenclature, which is therefore followed in these countries and the results obtained with these sera are reported in the literature. Strains of all types of pneumococci are also supplied to many institutions.

It will therefore cause a great deal of confusion if this nomenclature, generally employed as it is in Europe, were now to be altered.

For these reasons we decline to alter the nomenclature we published in 1940, which maintains Cooper's nomenclature and which in principle has been accepted by Walter and coworkers.

We therefore suggest that Kauffmann, Mørch and Schmith's nomenclature should receive International recognition.

REFERENCES

Eddy, B. E. Nomenclature of pneumococcic types. U.S. Public Health Reports 59:449. 1944.

_____. Cross reactions between the several pneumococcic types and their significance in the preparation of polyvalent antiserum. Ibid. 59:485. 1944.

_____. A simplified procedure for detecting cross reactions in diagnostic antipneumococcic serum. Ibid. 59:1041. 1944.

Kauffmann, F., E. Mørch, and K. Schmith. On the serology of the pneumococcus group. J. Immunol. 39:397. 1940.

Lund, E. Four new pneumococcus types. Acta Path. et Microbiol. 27:720. 1950.

Walter, A.W., V. Quevin, M.W. Beattie, H.Y. Cotler, and H. B. Bucca. Extension of the separation of types among the pneumococci: Description of 17 types in addition to Types 1 to 32 (Cooper). J. Immunol. 41:279. 1941.

INTERNATIONAL BULLETIN OF BACTERIOLOGICAL NOMENCLATURE AND TAXONOMY
Volume 4 April 15, 1954 No. 2 pp. 129-130

LETTERS TO THE EDITOR

Note on Streptococcus agalactiae

To the Editor:

In Number 4 of Volume 3 of the International Bulletin, Dr. J. Howard Brown has presented two articles on the classification of streptococci. I think he has made a very useful contribution to this subject which must have vexed many bacteriologists.

I should like to add a few comments based on findings over 20 years when streptococci, mostly from bovine mastitis, were investigated.

Cultural and biochemical tests on 6,310 streptococci known to be Group B Lancefield revealed that 92.6 per cent gave the following reactions regarded as characteristic for S. agalactiae: Hydrolysis of sodium hippurate, growth in MacConkey's (40 per cent bile salt) agar, acid and clot in litmus milk within 24 hours at 37°C., acid not produced in mannitol, aesculin not hydrolysed. Final pH in glucose broth came within 4.01 and 4.40 for the majority of the strains although some gave values below 3.80 and some above 5.01. Nearly 1/3 of the total number was strongly haemolytic on ox blood agar. Those producing haemolysis were predominantly of (Stableforth's) serological Type 3: members of this type failed to produce acid in salicin much more frequently than did those of Type 1 or Type 7 (the only other serological types encountered).

There were 463 isolates which deviated from the pattern just outlined. The majority (343) of these were aberrant only towards litmus milk, viz. acid production or clotting delayed or absent. However, 48 did not hydrolyse sodium hippurate, 68 grew poorly or not at all in McConkey's agar, 69 produced acid in mannitol and nine slightly hydrolysed aesculin. Repeated testing gave the same results and the strains appeared to be pure.

A total of 69 strains gave the standard reactions for S. agalactiae, but were not of Lancefield's serological Group B.

Of 2,547 strains tested in methylene blue milk (1:20,000 final concentration) 97.5 per cent gave reduction and clotting.

All strains were freshly isolated and tested immediately purity had been established.

I also had an opportunity to test 6,415 subcultures from 66 strains, some freshly isolated, some deliberately maintained under adverse conditions, for their reactions on sodium hippurate using Zwikker's reagent (copper sulfate and pyridine) to demonstrate benzoic acid. The strains came from milk from cows with subclinical and hyperacute mastitis, from cows before and after treatment with penicillin.

There was no evidence of nonhydrolyzing variants.

E. Munch-Petersen
Institute of Agriculture
University of Western Australia
Nedlands, Western Australia

INTERNATIONAL BULLETIN OF BACTERIOLOGICAL NOMENCLATURE AND TAXONOMY
Volume 4 April 15, 1954 No. 2 pp. 131-132

NEWS AND NOTES

Errata

The International Committee for Enteric Phage Typing

The Joint Chairmen of the International Committee for Enteric Phage Typing have requested publication of the following statement.

"We wish to draw your attention to the erroneous designation of this committee in Vol. 3 No. 4., of the International Bulletin of Bacteriological Nomenclature and Taxonomy. On page 161 under 'Minute 13' it is referred to as the "Enteric Phage Typing Committee"; in the index, page 204 it is referred to as "Enteric Phage-Typing Subcommittee". The correct designation of this Committee, which was formed in accordance with the recommendation adopted at the Plenary Session on July 6, 1947, of the Fourth International Congress for Microbiology, Copenhagen, is "The International Committee for Enteric Phage Typing".

We submit that Minute 13 is misleading because of this erroneous designation and request that the error be corrected in the next number of the International Bulletin of Bacteriological Nomenclature and Taxonomy."

Minute 7 of the 1953 (Rome) Meeting of the International Committee on Bacteriological Nomenclature

Dr. S.T. Cowan, Secretary of the Committee asks that attention be called to an error in Minute 7 (Int. Bull. Bact. Nom. Tax. 3:159. 1953) which should read "objections had been raised to Opinions 3 and 4" and not "objections had been raised to Opinions 3 and 5".

Transliteration of the Greek Letter Kappa into Latin

In Vol. 3 No. 2 and 3. p. 66 the transliteration of kappa in Greek words into Latin letters is incorrectly given in the heading. This should read

Greek K, κ, (kappa) Latin C, c
instead of
Greek K, κ, (kappa) Latin K, k

The example given is correctly transliterated.

Mailing Error

Through inadvertance a few subscribers received a copy of Volume 3 No. 4 of the International Bulletin of Bacteriological Nomenclature and Taxonomy, instead of Volume 4 No. 1 of the Bulletin containing the reports of the Subcommittee on the Enterobacteriaceae presented in 1950 at the Rio de Janeiro Congress of Microbiology and in 1953 at the Rome Congress. Any subscriber who failed to receive the first issue of Volume 4 will receive a copy by addressing:

The Editor, Int. Bull. Bact. Nom. and Tax.
Room 316, Curtiss Hall
Ames, Iowa, U.S.A.

Editorial Note

The review of the nomenclature of the coliform organisms by S.T. Cowan (this Bulletin p. 119) gives evidence that many of the names commonly used in bacteriology are not strictly correct according to the rules of bacteriological nomenclature. It is hoped that this review will stimulate much discussion, that those particularly interested in the names of the coliform bacteria will consider what steps should be taken to validate the names they use, and that substantial agreement may be reached in the nomenclature of this important group.